

CITY OF MOORPARK

TECHNICAL APPENDICES FOR THE GENERAL PLAN NOISE ELEMENT

November 1994

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APPENDIX A

TECHNICAL DATA

CITY OF MOORPARK

NOISE ELEMENT

CITY OF MOORPARK NOISE ELEMENT

TECHNICAL APPENDIX

1.0 NOISE ELEMENT REQUIREMENTS

The State of California has mandated that each county and city prepare a Noise Element as part of its General Plan. Section 65302(f) of the California Government Code specifically requires:

(f) A Noise Element shall identify and appraise noise problems in the community. The noise element shall recognize the guidelines established by the Office of Noise Control in the State Department of Health Services and shall analyze and quantify, to the extent practicable, as determined by the legislative body, current and projected noise levels for all of the following sources:

- 1. Highways and freeways.*
- 2. Primary arterials and major local streets.*
- 3. Passenger and freight on-line railroad operations and ground rapid transit systems.*
- 4. Commercial, general aviation, heliport, helistop, and military airport operations, aircraft overflights, jet engine test stands, and all other ground facilities and maintenance functions related to airport operation.*
- 5. Local industrial plants, including, but not limited to, railroad classification yards.*
- 6. Other ground stationary noise sources identified by local agencies as contributing to the community noise environment.*

Noise contours shall be shown for all of the sources and stated in terms of community noise equivalent level (CNEL) or day-night average level (LDN). The noise contours shall be prepared on the basis of noise monitoring or following generally accepted noise modeling techniques for the various sources identified in paragraphs (1) to (6), inclusive. The noise contours shall be used as a guide for establishing a pattern of land uses in the land use element that minimizes the exposure of community residents to excessive noise. The Noise Element shall include implementation measures and possible solutions that address existing and foreseeable noise problems, if any. The adopted noise element shall serve as a guideline for compliance with the state's noise insulation standards.

SOUND LEVELS AND LOUDNESS OF ILLUSTRATIVE NOISES IN INDOOR AND OUTDOOR ENVIRONMENTS
(A-Scale Weighted Sound Levels)

dB(A)	OVER-ALL LEVEL Sound Pressure Level Approx. 0.0002 Microbars	COMMUNITY (Outdoor)	HOME OR INDUSTRY	LOUDNESS Human Judgement of Different Sound Levels
130	UNCOMFORTABLY	Military Jet Aircraft Take-Off With After-burner From Aircraft Carrier @ 50 Ft. (130)	Oxygen Torch (121)	120 dB(A) 32 Times as Loud
120 110	LOUD	Turbo-Fan Aircraft @ Take Off Power @ 200 Ft. (90)	Riveting Machine (110) Rock-N-Roll Band (108-114)	110 dB(A) 16 Times as Loud
100	VERY	Jet Flyover @ 1000 Ft. (103) Boeing 707, DC-8 @ 6080 Ft. Before Landing (106) Bell J-2A Helicopter @ 100 Ft. (100)		100 dB(A) 8 Times as Loud
90	LOUD	Power Mower (96) Boeing 737, DC-9 @ 6080 Ft. Before Landing (97) Motorcycle @ 25 Ft. (90)	Newspaper Press (97)	90 dB(A) 4 Times as Loud
80		Car Wash @ 20 Ft. (89) Prop. Airplane Flyover @ 1000 Ft. (88) Diesel Truck, 40 MPH @ 50 Ft. (84) Diesel Train, 45 MPH @ 100 Ft. (83)	Food Blender (88) Milling Machine (85) Garbage Disposal (80)	80 dB(A) 2 Times as Loud
70	MODERATELY LOUD	High Urban Ambient Sound (80) Passenger Car, 65 MPH @ 25 Ft. (77) Freeway @ 50 Ft. From Pavement Edge, 10:00 AM (76 + or - 6)	Living Room Music (76) TV-Audio, Vacuum Cleaner	70 dB(A)
60		Air Conditioning Unit @ 100 Ft. (60)	Cash Register @ 10 Ft. (65-70) Electric Typewriter @ 10 Ft. (64) Dishwasher (Rinses) @ 10 Ft. (60) Conversation (60)	60 dB(A) 1/2 as Loud
50	QUIET	Large Transformers @ 100 Ft. (50)		50 dB(A) 1/4 as Loud
40		Bird Calls (44) Lower Limit Urban Ambient Sound (40)		40 dB(A) 1/8 as Loud
	JUST AUDIBLE	(dB(A) Scale Interrupted)		
10	THRESHOLD OF HEARING			

SOURCE: Reproduced from Melville C. Branch and R. Dale Beiland, Outdoor Noise in the Metropolitan Environment,
Published by the City of Los Angeles, 1970, p.2.

Appendix A of the State of California General Plan Guidelines (The State Guidelines for Preparation and Content of Noise Elements of the General Plan) indicates that the Noise Element should present the noise environment in terms of noise contours. For those areas identified as containing noise-sensitive facilities, the noise environment is determined by monitoring. The purpose of this Technical Appendix is to provide background and supporting information for the City of Moorpark Noise Element. This Appendix contains background information on noise, information on the health effects of noise, noise assessment criteria, methodology in determining the noise environment, measurement and modeling results, and a glossary (beginning on page C-1).

2.0 BACKGROUND ON NOISE

2.1 Noise Definitions

Sound is technically described in terms of the loudness (amplitude) and frequency (pitch) of the sound. The standard unit of measurement of the loudness of sound is the Decibel (dB). Since the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear.

Decibels are based on the logarithmic scale. The logarithmic scale compresses the wide range in sound pressure levels to a more usable range of numbers in a manner similar to the way that the Richter scale is used to measure earthquakes. In terms of human response to noise, a sound 10 dBA higher than another is judged to be twice as loud; and 20 dBA higher four times as loud; and so forth. Everyday sounds normally range from 30 dB (very quiet) to 100 dB (very loud). Examples of various sound levels in different environments are shown in Exhibit 1.

Sound levels decrease as a function of distance from the source as a result of wave divergence, atmospheric absorption, and ground attenuation. As the sound wave form travels away from the source, the sound energy is spread over a greater area, dispersing the sound power of the wave. Atmospheric absorption also influences the levels that are received by the observer. The greater the distance traveled, the greater the influence and the resultant fluctuations. The degree of absorption is a function of the frequency of the sound as well as the humidity and temperature of the air. Turbulence and gradients of wind, temperature and humidity also play a

significant role in determining the degree of attenuation.

Noise has been defined as unwanted sound and it is known to have several adverse effects on people. From these known effects of noise, criteria have been established to help protect the public health and safety and prevent disruption of certain human activities. This criteria is based on such known effects of noise on people as hearing loss (not generally a factor with community noise), communication interference, sleep interference, physiological responses and annoyance. Each of these potential noise impacts on people are briefly discussed in the following narratives:

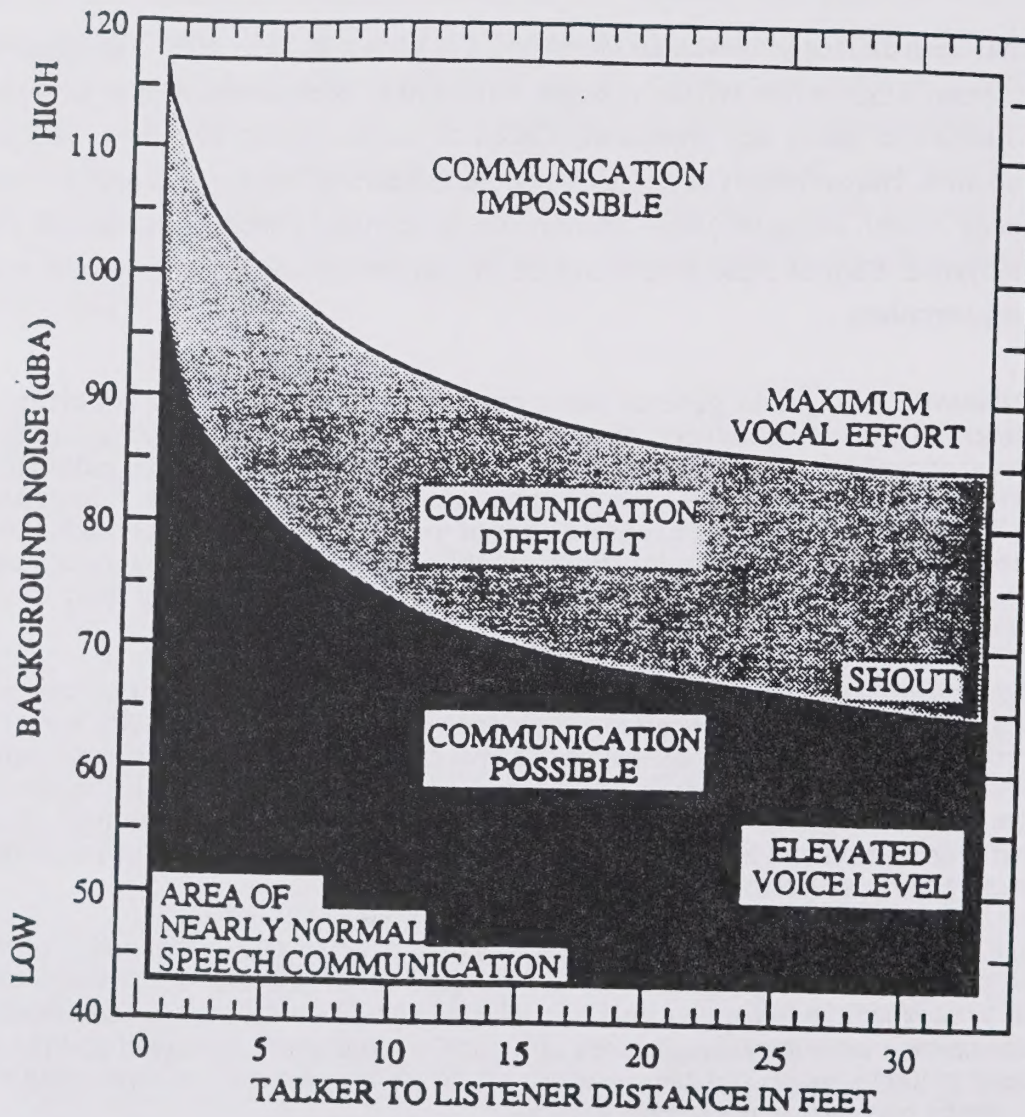
HEARING LOSS is, in general, not a concern in community noise problems. The potential for noise-induced hearing loss is more commonly associated with occupational noise exposures in heavy industry or very noisy work environments with long-term exposure. The Occupational Safety and Health Administration (OSHA) identifies a noise exposure limit of 90 dBA for 8 hours per day to protect from hearing loss. Noise levels in neighborhoods, even in very noisy airport environments near major international airports, is not sufficiently loud to cause hearing loss.

COMMUNICATION INTERFERENCE is one of the primary concerns in environmental noise problems. Communication interference includes interference with speech and activities such as watching television. Normal conversational speech is in the range of 60 to 65 dBA and any noise in this range or louder may interfere with speech. There are specific methods of describing speech interference as a function of distance between speaker and listener and voice level. Exhibit 2 shows the percent of sentence intelligibility with respect to various noise levels.

SLEEP INTERFERENCE is a major noise concern in noise assessment and, of course, is most critical during nighttime hours. Sleep disturbance is one of the major causes of annoyance due to community noise. Noise can make it difficult to fall asleep, and can create momentary disturbances of natural sleep patterns by causing shifts from deep to lighter stages and cause awakening. Noise may even cause awakening which a person may or may not be able to recall.

Extensive research has been conducted on the effect of noise on sleep disturbance. Recommended values for desired sound levels in residential bedroom space range from 25 to 45 dBA with 35 to 40 dBA being the norm. The National Association of Noise Control Officials have published data on the probability of sleep disturbance with various single event noise levels. Based on experimental sleep data as related to noise exposure, a 75 dBA interior noise level event will cause noise induced awakening in 30 percent of the cases.

PHYSIOLOGICAL RESPONSES are those measurable effects of noise on people which are realized as changes in pulse rate, blood pressure, etc. While such effects can be induced and observed, the extent is not known to which these physiological responses cause harm or are a sign of harm. Generally, physiological responses are a



reaction to a loud short term noise such as a rifle shot or a very loud jet overflight.

ANNOYANCE is a very individual characteristic and can vary widely from person to person. What one person considers tolerable can be quite unbearable to another of equal hearing capability. The level of annoyance, of course, depends on the characteristics of the noise (i.e.; loudness, frequency spectra, time, and duration), and how much activity interference (e.g. speech interference and sleep interference) results from the noise. However, the level of annoyance is also a function of the attitude of the receiver. Personal sensitivity to noise varies widely. It has been estimated that 2 to 10 percent of the population is highly susceptible to noise that they themselves did not generate, while approximately 20 percent are unaffected by noise. Attitudes are affected by the relationship between the person and the noise source (Is it our dog barking or the neighbor's dog?). Whether we believe that someone is trying to abate the noise will also affect our level of annoyance.

2.2 Noise Metric and Assessment Criteria

Community noise is generally not a steady state and varies with time. Under conditions of non-steady state noise, some type of statistical metric is necessary in order to quantify noise exposure over a long period of time. Several rating scales have been developed for describing the effects of noise on people. They are designed to account for the above known effects of noise on people.

Based on these effects, the observation has been made that the potential for noise to impact people is dependent on the total acoustical energy content of the noise. A number of noise scales have been developed to account for this observation. These scales are: the Equivalent Noise Level (LEQ), the Day Night Noise Level (LDN), and the Community Noise Equivalent Level (CNEL). These scales are described in the following paragraphs.

LEQ is the "energy" average noise level during the time period of the sample. It is a number that represents a decibel sound level. This constant sound level would contain an equal amount of energy as a fluctuating sound level over a given period of time. *LEQ* can be measured for any time period, but is typically measured for 15 minutes, 1 hour or 24-hours.

LDN is a 24-hour, time-weighted annual average noise level. Time-weighted refers to the fact that noise which occurs during certain sensitive time periods is penalized for occurring at these times. In the *LDN* scale, those events that take place during the night (10 pm to 7 am) are penalized by 10 dB. This penalty was selected to attempt to account for increased human sensitivity to noise during the quieter period of a day, where sleep is the most probable activity.

CNEL is similar to the *LDN* scale except that it includes an additional 5 dBA penalty

Table 1
Noise Measurement Results

Site	Date	Time End	Leq	Lmax	L1.7	L8.3	L25	L50	L99
1 - Campus Canyon School	29-Mar-94	11:00	52.1	67.9	60.7	56.2	51.8	48.2	41.6
2 - Flory School	29-Mar-94	14:15	50.7	68.1	60.2	52.0	49.4	47.7	43.7
3 - Chaparral Middle School	15-Mar-94	13:15	62.0	78.0	72.1	66.2	61.3	54.9	47.1
4 - Peach Hill School	29-Mar-94	14:40	50.8	63.1	59.2	54.7	52.1	48.0	40.5
5 - Moorpark High School	15-Mar-94	11:20	52.2	64.6	58.7	55.5	52.5	50.7	45.2
6 - Moorpark Community High School	29-Mar-94	12:50	52.6	68.9	63.1	55.1	51.3	49.5	44.5
7 - Mesa Verde Middle School	15-Mar-94	9:50	45.7	59.6	54.6	48.7	45.2	42.7	38.7
8 - Monte Vista Nature Park	15-Mar-94	10:15	56.9	74.6	66.6	60.9	56.6	48.2	34.9
9 - City Hall Park	15-Mar-94	14:50	63.9	76.0	72.5	69.4	63.3	59.2	45.3
10 - Campus Park	4-Apr-94	15:45	60.6	69.0	61.1	60.9	59.8	58.7	55.1
11 - Paul Griffin Park	29-Mar-94	11:25	52.6	58.7	56.4	55.1	53.8	51.9	47.4
12 - Future Downtown Park	4-Apr-94	15:20	64.3	75.0	69.2	64.0	61.9	60.4	56.7
13 - Tierra Rejada West of Mountain Trail	4-Apr-94	13:45	56.1	74.5	62.4	58.7	54.7	50.1	39.0
14 - Spring and Second	4-Apr-94	14:55	65.3	83.9	75.2	69.2	64.0	59.1	45.2
15 - Varsity Park Condo Area	29-Mar-94	12:15	53.7	64.3	59.8	57.4	54.3	51.9	46.5
16 - Moorpark Pines Apts	4-Apr-94	14:20	59.3	67.1	65.3	64.1	60.3	58.8	44.1
17 - Tierra Rejada Road (Venture Co. Nursery)	15-Mar-94	9:50	62.7	73.2	71.1	68.7	62.7	55.6	39.2
18 - Villa Del Arroyo MHP	4-Apr-94	16:05	65.8	81.1	74.0	69.4	64.3	57.9	52.7
19 - 6406 Gransen Court	29-Mar-94	11:50	55.4	61.3	59.6	57.9	56.2	54.8	50.3
20 - Maureen/Los Angeles	15-Mar-94	11:45	70.6	82.4	78.5	74.3	71.2	68.5	55.1

Table 2
Long Term (24 Hour) Noise Measurement Results

Site	CNEL
Long Term 1 - 282 Fremont	70.5 CNEL
Long Term 2 - 6485 Westwood	55.0 CNEL
Long Term 3 - 489 Comett	61.5 CNEL
Long Term 4 - Walnut Canyon	58.4 CNEL
Long Term 5 - 13853 E. Los Angeles	62.6 CNEL
Long Term 6 - 13990 Keisha	57.5 CNEL
Long Term 7 - 4998 Mira Sol	71.6 CNEL

4.2 Noise Contours

The existing and future noise levels in the City were established in terms of the CNEL indices by modeling all of the traffic noise sources for the existing and future traffic and speed characteristics. The results for the roadways are presented in tabularized format in the following tables. The existing contours are presented in Table 3 and the future contours are presented in Table 4. The data in these tables represent the distance from the centerline of the road to the contour value shown. Note that these tables do not include the mitigating effect of noise barriers or topography. The traffic mix assumptions used in this analysis are shown in Table 5. The existing roadway noise contours are shown graphically in Exhibit 10. These contours are based on existing traffic volumes that were determined by traffic counts. The future traffic noise contours are shown graphically in Exhibit 11. These contours are based on projected traffic volumes supplied by the City of Moorpark.

Table 3
Existing Roadway Noise Contours

Roadway & Link	Distance to CNEL Contour from Centerline of Roadway (Feet)		
	70 CNEL	65 CNEL	60 CNEL
CAMPUS PARK			
Princeton to Collins	20	42	91
East of Collins	25	53	114
LOS ANGELES			
South of SR-118	14	30	65
POINDEXTER			
Gabbert to Walnut Canyon	14	30	65
HIGH			
Moorpark to Spring	25	53	114
LOS ANGELES (SR-118)			
West of Gabbert	59	127	273
East of Gabbert	65	139	300
West of Park Lane	65	139	300
Parklane to Moorpark	72	155	333
Moorpark to Spring (break in roadway)	89	191	411
Spring to SR-23	29	63	135
East of SR-23	25	53	114
NEW LOS ANGELES			
West of Spring	89	191	411
Spring to Science	82	177	381
Science to SR-23	82	177	381
TIERRA REJADA			
Los Angeles to Countrywood	RW	80	172
Countrywood to Mountain Trail	RW	80	172
East of Mountain Trail	RW	80	172
West of Walnut Creek	RW	80	172
Walnut Creek to Peach Hill	RW	90	194
Peach Hill to Spring	RW	105	225
Spring to Science	51	109	235
East of Science	51	109	235
West of SR-23	61	131	282
East of SR-23	RW	90	194
HAPPY CAMP/WALNUT CANYON			
Casey to Poindexter	RW	58	125
South of Poindexter	RW	72	154
MOORPARK			
North of New Los Angeles	RW	59	127
South of Tierra Rejada	RW	RW	85

Table 3 (continued)
Existing Roadway Noise Contours

Roadway & Link	Distance to CNEL Contour from Centerline of Roadway (Feet)		
	70 CNEL	65 CNEL	60 CNEL
SPRING			
South of High Los Angeles	RW	53	114
North of New Los Angeles	RW	53	114
South of New Los Angeles	RW	63	135
North of Peach Hill	RW	63	135
Peach Hill to Barrett	RW	RW	91
Barrett to Tierra Rejada	RW	RW	91
PRINCETON			
Campus Park to D Street	RW	52	111
South of SR-118	RW	RW	94
COLLINS			
South of SR-118	RW	55	119
North of SR-118	RW	76	163
TRAIN (Southern Pacific Trans. Co.)	188	405	872

RW - Contour does not extend past the roadway right-of-way.

Table 4
Future Roadway Noise Contours

Roadway & Link	Distance to CNEL Contour from Centerline of Roadway (Feet)		
	70 CNEL	65 CNEL	60 CNEL
BROADWAY			
West of Shekell	RW	RW	65
East of Shekell	RW	RW	79
West of Grimes Canyon	RW	RW	31
Grimes Canyon to Happy Camp	RW	RW	103
Happy Camp to SR-23	RW	67	145
East of SR-23	RW	96	206
East east SR-23	RW	67	145
North of SR-118	RW	92	198
CAMPUS PARK			
West of Princeton	RW	RW	65
Princeton to Collins	RW	63	135
East of Collins	RW	92	198
D STREET			
SR-23 to Princeton	RW	RW	53
STATE ROUTE 118			
West of Grimes Canyon	140	302	650
Grimes Canyon to Hitch	137	294	634
East of Hitch	143	309	665
North of Los Angeles	108	233	502
West of Gabbert	96	208	447
East of Gabbert	116	249	536
West of Walnut Canyon	119	257	553
Walnut Canyon to SR-23	143	309	665
SR-23 to Princeton	130	280	602
Princeton to Collins	270	582	1253
East of Collins	270	582	1253
LOS ANGELES			
South of SR-118	RW	58	125
CASEY			
Gabbert to Walnut Canyon	RW	25	53
POINDEXTER			
Gabbert to Walnut Canyon	RW	25	53
HIGH			
Moorpark to Spring	RW	58	125

RW - Contour does not extend past the roadway right-of-way.

Table 4 (continued)
Future Roadway Noise Contours

Roadway & Link	Distance to CNEL Contour from Centerline of Roadway (Feet)		
	70 CNEL	65 CNEL	60 CNEL
LOS ANGELES			
East of SR-118	61	131	282
West of Gabbert	63	135	291
East of Gabbert	77	166	358
West of Park Lane	85	184	396
Parklane to Moorpark	82	177	381
East of Moorpark	99	214	462
West of Spring	108	233	503
(break in roadway)			
Spring to SR-23	RW	RW	103
East of SR-23	RW	RW	91
NEW LOS ANGELES			
Spring to Science	99	214	462
Science to SR-23	102	221	476
PEACH HILL			
Tierra Rejada to Mesa Verde	RW	RW	RW
West of Spring	RW	RW	94
East of Spring	RW	RW	53
CHRISTIAN/BARRETT			
Peach Hill to Spring	RW	RW	53
TIERRA REJADA			
Los Angeles to Countrywood	57	122	264
Countrywood to Mountain Trail	51	109	235
East of Mountain Trail	35	74	160
West of Walnut Creek	32	69	148
Walnut Creek to Peach Hill	42	90	194
Peach Hill to Spring	51	109	235
Spring to Science	55	118	254
East of Science	66	143	308
West of SR-23	74	159	342
East of SR-23	53	114	245
COUNTRYWOOD			
West of Tierra Rejada	RW	RW	RW
MOUNTAIN TRAIL			
Northeast of Tierra Rejada	RW	RW	RW
Southwest of Tierra Rejada	RW	RW	75
MOUNTAIN MEADOW			
North of Tierra Rejada	RW	RW	RW
South of Tierra Rejada	RW	RW	RW

RW - Contour does not extend past the roadway right-of-way.

Table 4 (continued)
Future Roadway Noise Contours

Roadway & Link	Distance to CNEL Contour from Centerline of Roadway (Feet)		
	70 CNEL	65 CNEL	60 CNEL
WALNUT CREEK			
North of Tierra Rejada	RW	RW	RW
South of Tierra Rejada	RW	RW	RW
SHEKELL			
Broadway to Grimes Canyon	RW	RW	RW
GRIMES CANYON			
Broadway to Shekell	RW	RW	91
Broadway to C Street	RW	RW	79
South of C Street	RW	RW	65
North of SR-118	RW	RW	RW
HITCH			
South of SR-118	RW	RW	53
HAPPY CAMP/WALNUT CANYON			
North of Broadway	RW	58	125
Broadway to C Street	RW	RW	79
C Street to SR-118	RW	RW	79
SR-118 to Casey	RW	RW	79
Casey to Poindexter	RW	RW	103
South of Poindexter	RW	72	154
MOORPARK			
North of New Los Angeles	RW	66	142
South of Tierra Rejada	RW	55	119
SPRING			
South of SR-118	RW	72	154
North of High/Los Angeles	RW	67	145
South of High/Los Angeles	RW	80	172
North of New Los Angeles	RW	84	181
South of New Los Angeles	RW	80	172
North of Peach Hill	RW	67	145
Peach Hill to Barrett	RW	RW	91
Barrett to Tierra Rejada	RW	RW	103
SCIENCE			
South of New Los Angeles	RW	124	267
North of Peach Hill	RW	RW	103
Peach Hill to Tierra Rejada	RW	58	125

RW - Contour does not extend past the roadway right-of-way.

Table 4 (continued)
Future Roadway Noise Contours

Roadway & Link	Distance to CNEL Contour from Centerline of Roadway (Feet)		
	70 CNEL	65 CNEL	60 CNEL
STATE ROUTE 23			
South of Broadway	112	241	519
C Street to D Street	119	257	553
D Street to SR-118	108	233	502
South of SR-118	75	162	348
North of New Los Angeles	233	501	1080
New Los Angeles to Tierra Rejada	238	512	1104
South of Tierra Rejada	253	545	1174
PRINCETON			
Campus Park to D Street	RW	62	135
South of SR-118	RW	RW	103
COLLINS			
South of SR-118	RW	62	135
North of SR-118	52	113	243

RW - Contour does not extend past the roadway right-of-way.

for events that occur during the evening (7 pm to 10 pm) time period. Either LDN or CNEL may be used to identify community noise impacts within the Noise Element. Example noise environments in terms of the CNEL metric are shown in Exhibit 3.

The public reaction to different noise levels varies from community to community. Extensive research has been conducted on human responses to exposure of different levels of noise. Exhibit 4 relates LDN noise levels to community response from some of these surveys. Community noise standards are derived from tradeoffs between community response surveys and economic considerations for achieving these levels.

Intermittent or occasional noise such as those associated with stationary noise sources is not of sufficient volume to exceed community noise standards that are based on a time averaged scale such as the CNEL scale. To account for intermittent noise, another method to characterize noise is the Percent Noise Level (L%). The Percent Noise Level is the level exceeded X% of the time during the measurement period. Percent Noise Levels are another method of characterizing ambient noise where, for example, L90 is the noise level exceeded 90 percent of the time, L50 is the level exceeded 50 percent of the time, and L10 is the level exceeded 10 percent of the time. L90 represents the background or minimum noise level, L50 represents the average noise level, and L10 the peak or intrusive noise levels. Examples of various noise environments in terms of the Percent Noise Levels are shown in Exhibit 5.

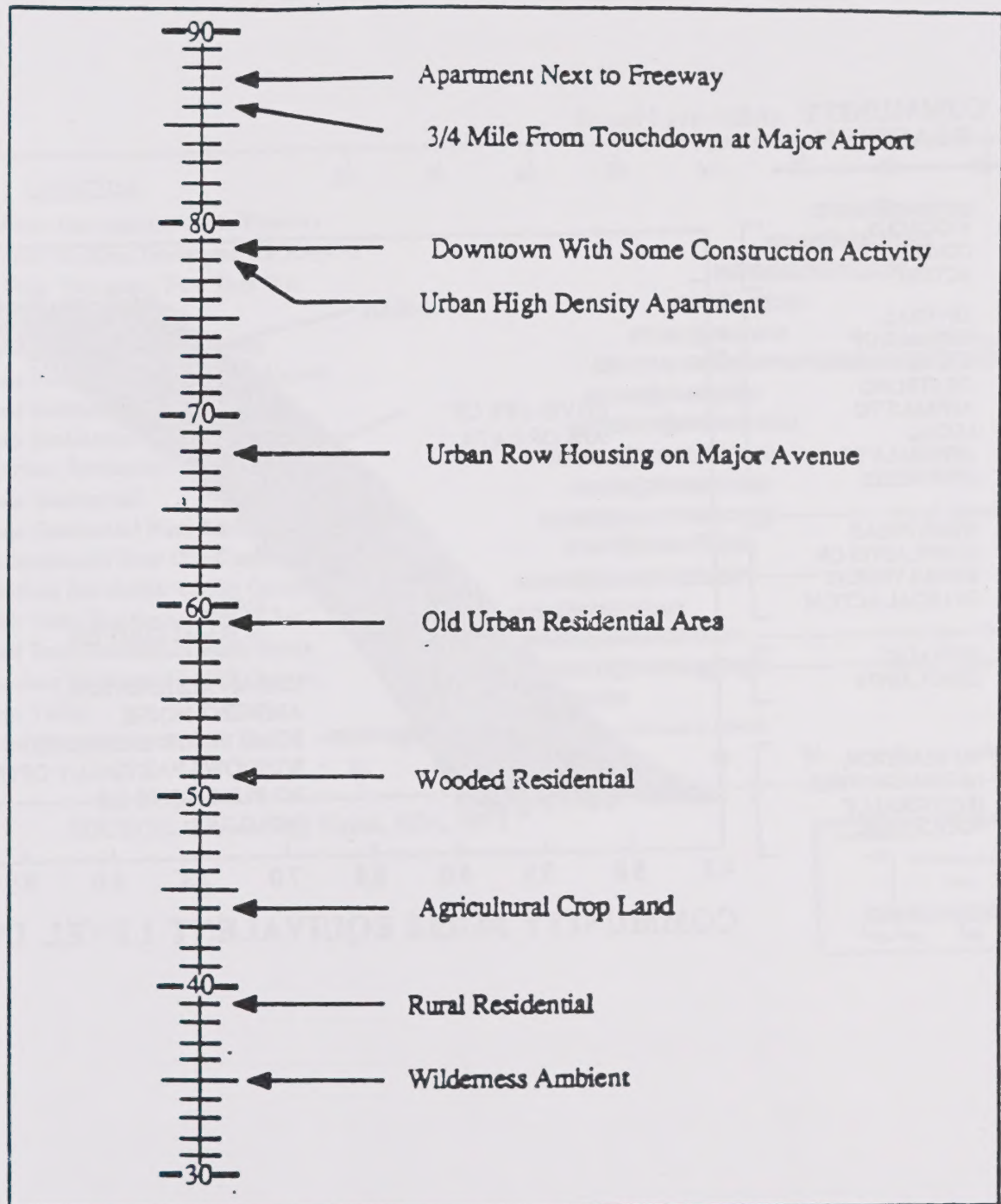
Noise Ordinances are typically specified in terms of the Percent Noise Levels. Ordinances are designed to protect people from non-transportation related noise sources such as loud music, machinery and vehicular traffic on private property. Noise Ordinances apply to motor vehicle noise on public streets or other transportation-related noise sources that are not preempted by State or Federal government requirements.

2.3 Noise and Land Use Compatibility Guidelines

The purpose of this section is to present information regarding the compatibility of various land uses with environmental noise. It is from these guidelines and standards that the City of Moorpark Noise Criteria and Standards will be developed. Noise/land use guidelines have been produced by a number of Federal and State agencies including the Federal Highway Administration, the Environmental Protection Agency, the Department of Housing and Urban Development, the American National Standards Institute and the State of California. These guidelines, presented in the following paragraphs, are all based upon cumulative noise criteria such as LEQ, LDN or CNEL.

CNEL

Outdoor Location



COMMUNITY REACTION

VIGOROUS
COMMUNITY
ACTION

SEVERAL
THREATS OF
LEGAL ACTION,
OR STRONG
APPEALS TO
LOCAL
OFFICIALS TO
STOP NOISE

WIDESPREAD
COMPLAINTS OR
SINGLE THREAT
OF LEGAL ACTION

SPORADIC
COMPLAINTS

NO REACTION,
ALTHOUGH NOISE
IS GENERALLY
NOTICEABLE

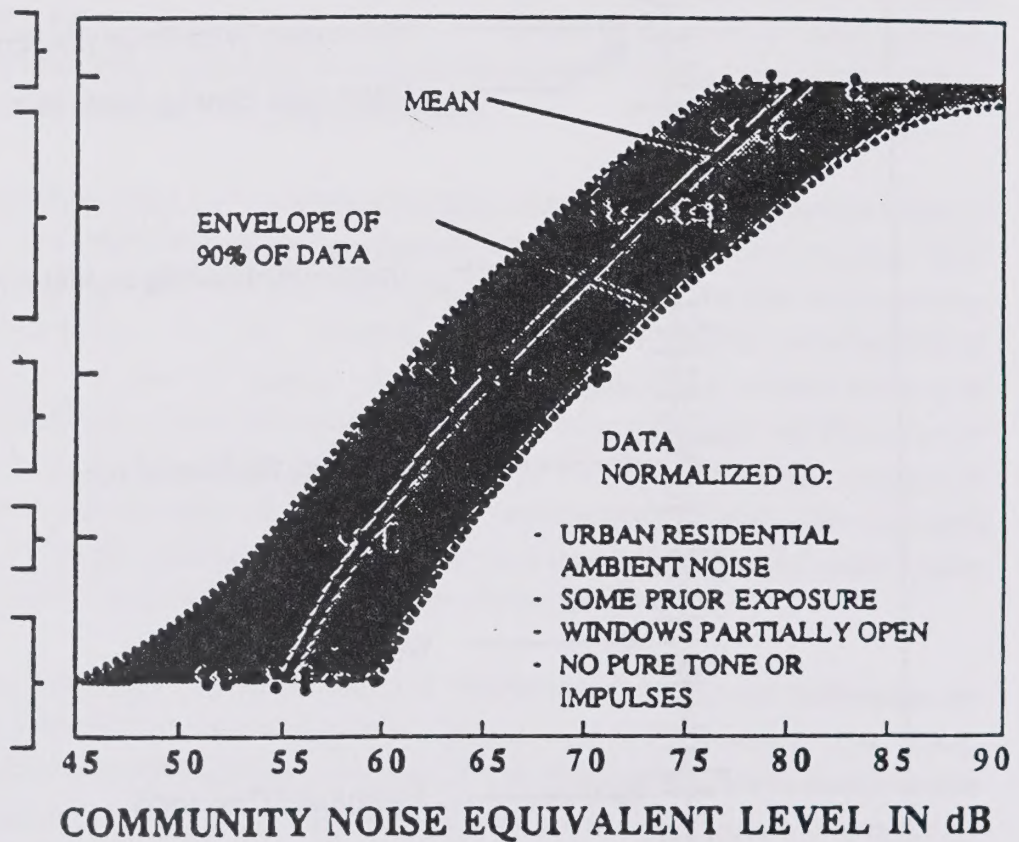
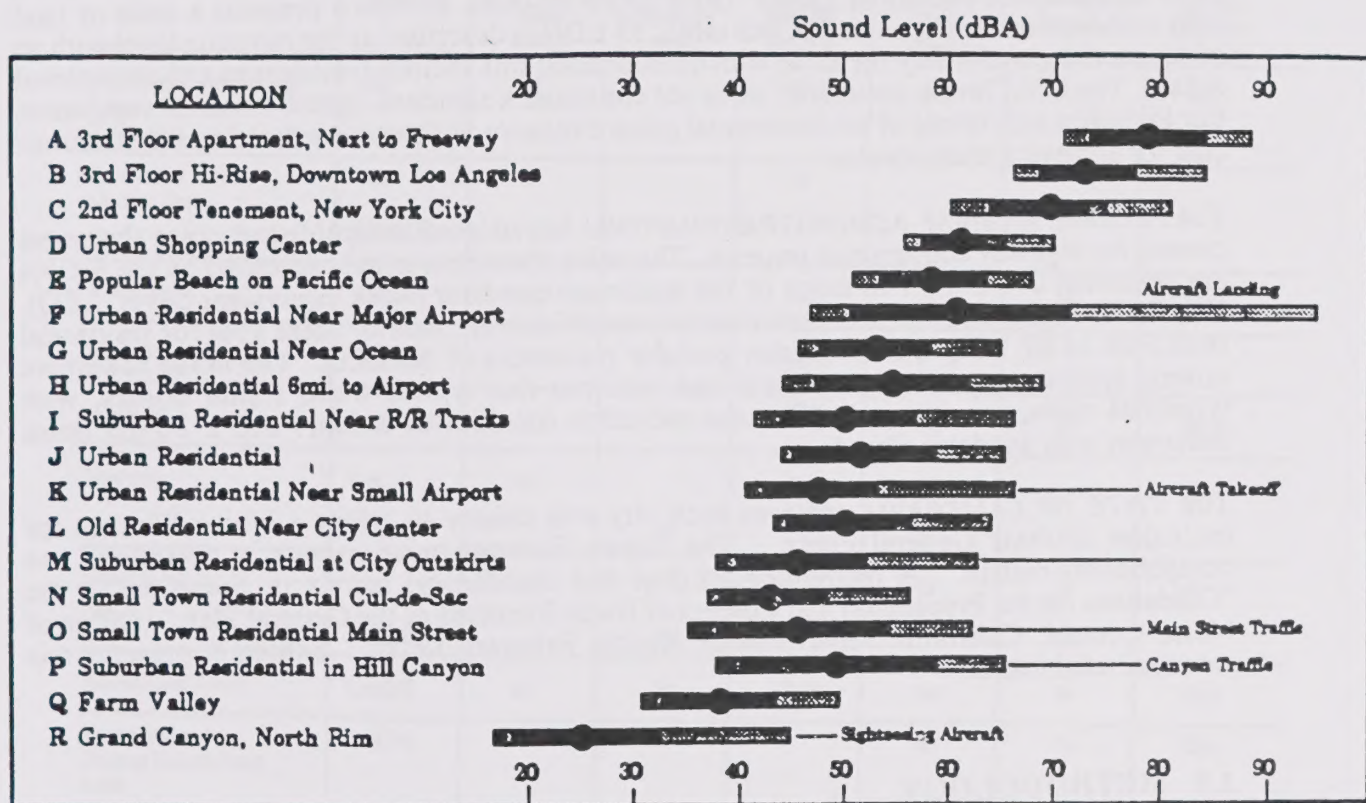
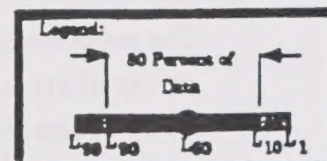


Exhibit 4

Community Response to Ldn Noise Levels



SOURCE: Community Noise, EPA, 1971



In March 1974, the *ENVIRONMENTAL PROTECTION AGENCY* published a document entitled "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare With an Adequate Margin of Safety" (EPA 550/9-74-004). Exhibit 6 presents a table of land uses and requisite noise levels. In this table, 55 LDN is described as the requisite level with an adequate margin of safety for areas with outdoor uses; this includes residences and recreational areas. The EPA "levels document" does not constitute a standard, specification or regulation, but identifies safe levels of environmental noise exposure without consideration for economic cost for achieving these levels.

The *FEDERAL HIGHWAY ADMINISTRATION (FHWA)* has adopted and published noise abatement criteria for highway construction projects. The noise abatement criteria specified by the FHWA are presented in Exhibit 7 in terms of the maximum one-hour Noise Equivalent Level (LEQ). The FHWA noise abatement criteria basically establishes an exterior noise goal for residential land uses of 67 LEQ and an interior goal for residences of 52 LEQ. The noise abatement criteria applies to private yard areas and assumes that typical wood frame homes, with windows open, provide a 10 dB noise reduction (outdoor to indoor) and a 20 dB noise reduction with windows closed.

The *STATE OF CALIFORNIA* requires each city and county to adopt a Noise Element for inclusion in their General Plans. The Noise Element must contain a noise/land use compatibility matrix. A recommended (but not mandatory) matrix is presented in the "Guidelines for the Preparation and Content of Noise Elements of the General Plan," (Office of Noise Control, California Department of Health, February 1976). Exhibit 8 presents this recommended matrix.

3.0 METHODOLOGY

The noise environment in Moorpark was modeled using a comprehensive noise measurement survey of existing noise sources and incorporating these results into computer noise models (it is, of course, impossible to measure future noise levels so we must rely on computer noise models for future noise estimates). The noise environment is commonly presented graphically in terms of lines of equal noise levels, or contours. The following paragraphs detail the methodology used in the measurements and modeling.

3.1 Measurement Procedure

Twenty-seven sites were selected for measurement of the noise environment in Moorpark. A review of noise complaints and identification of major noise sources in the community provided the initial base for development of the community noise survey. The measurement locations were selected on the basis of proximity to major noise sources and noise sensitivity of the land use. The measurement locations are depicted in Exhibit 9.

	Measure	Indoor Activity Interference	Hearing Loss Consideration	To Protect Against Both Effects (b)	Outdoor Activity Interference	Hearing Loss Consideration	To Protect Against Both Effects (b)
Residential with Outside Space and Farm Residences	Ldn	45		45	55		55
	Leq(24)		70			70	
Residential with No Outside Space	Ldn	45		45			
	Leq(24)		70				
Commercial	Leq(24)	(a)	70	70(c)	(a)	70	70(c)
Inside Transportation	Leq(24)	(a)	70	(a)			
Industrial	Leq(24)(d)	(a)	70	70(c)	(a)	70	70(c)
Hospitals	Ldn	45		45	55		55
	Leq(24)		70			70	
Educational	Ldn	45		45	55		55
	Leq(24)		70			70	
Recreational Areas	Leq(24)	(a)	70	70(c)	(a)	70	70(c)
Farm Land and General Unpopulated Land	Leq(24)				(a)	70	70(c)

Codes:

- Since different types of activities appear to be associated with different levels, identification of a maximum level for activity interference may be difficult except in those circumstances where speech communication is a critical activity.
- Based on lowest level.
- Based only on hearing loss.
- An Leq(8) of 75 dB may be identified in these situations so long as the exposure over the remaining 16 hours per day is low enough to result in a negligible contribution to the 24-hour average, i.e., no greater than an Le of 60 dB.

Note: Explanation of identified level for hearing loss: The exposure period which results in hearing loss at the identified level is a period of 40 years.

* Refers to energy rather than arithmetic averages.

SOURCE : EPA

ACTIVITY CATEGORY	DESIGN NOISE LEVEL - LEQ	DESCRIPTION OF ACTIVITY CATEGORY
A	57 (Exterior)	Tracts of land in which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose. Such areas could include amphitheaters, particular parks or portions of open spaces, or historic districts which are dedicated or recognized by appropriate local officials for activities requiring special qualities of serenity and quiet.
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas and parks which are not included in category A and residences, motels, hotels, public meeting rooms, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in Category A or B above.
D	-	For requirements of undeveloped lands see FHWA PPM 773.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Land Use Category	Community Noise Exposure Ldn or CNEL, dB					
	55	60	65	70	75	80
Residential - Low Density Single Family, Duplex, Mobile Homes						
Residential - Multiple Family						
Transient Lodging - Motels, Hotels						
Schools, Libraries, Churches Hospitals, Nursing Homes						
Auditoriums, Concert Halls, Amphitheatres						
Sports Arena, Outdoor Spectator Sports						
Playgrounds, Neighborhood Parks						
Golf Courses, Riding Stables Water Recreation, Cemeteries						
Office Buildings, Business Commercial and Residential						
Industrial, Manufacturing Utilities Agriculture						

Interpretation

Normally Acceptable

Specified Land Use is Satisfactory. Based Upon the Assumption that Any Buildings Involved are of Normal Conventional Construction, Without Any Special Noise Insulation Requirements.

Conditionally Acceptable

New Construction or Development Should be Undertaken Only After a Detailed Analysis of the Noise Reduction Requirement is Made and Needed Noise Insulation Features Included in the Design. Conventional Construction, but with Closed Windows and Fresh Air Supply Systems or Air Conditioning, Will Normally Suffice.

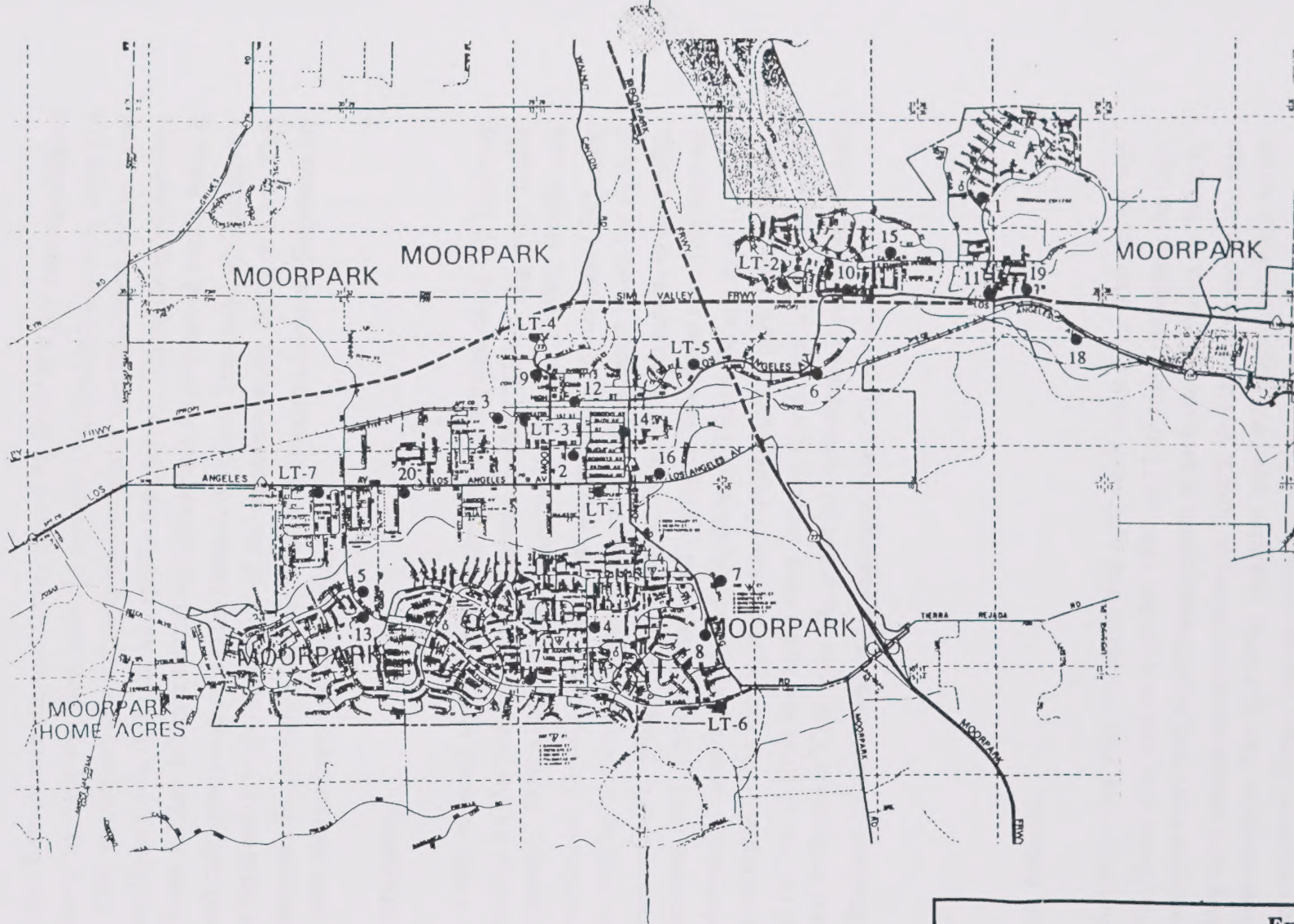
Normally Unacceptable

New Construction or Development Should Generally be Discouraged. If New Construction or Development Does Proceed, a Detailed Analysis of the Noise Reduction Requirements Must be Made and Needed Noise Insulation Features Included in the Design.

Clearly Unacceptable

New Construction or Development Should Generally not be Undertaken.





MESTRE GREVE ASSOCIATES

Exhibit 9

Noise Measurement Locations



The Moorpark Noise Element measurement survey utilized the Brüel & Kjær automated digital noise data acquisition systems for short-term (15 minute) LEQ readings and long term (24 hour) readings. This instrument automatically calculates both the Equivalent Noise Level (LEQ) and Percent Noise Level (L%) for any specific time period. The noise monitors were equipped with a Brüel & Kjær 1/2 inch electret microphone and was calibrated with a Brüel & Kjær calibrator with calibrations traceable to the National Bureau of Standards. Calibration for the calibrators are certified through the duration of the measurements by Brüel & Kjær. This measurement system satisfies the ANSI (American National Standards Institute) Standards for Type 1 precision noise measurement instrumentation.

3.2 Computer Modeling

The traffic noise levels projected in the Noise Element were computed using the Highway Noise Model published by the Federal Highway Administration ("FHWA Highway Traffic Noise Prediction Model," FHWA-RD-77-108, December 1978). The FHWA Model uses traffic volume, vehicle mix, vehicle speed, and roadway geometry to compute LEQ noise levels. A computer code has been written which computes equivalent noise levels for each of the time periods used in CNEL. Weighting and summing the noise levels results in the CNEL for the traffic projections used. The traffic data used to project these noise levels are derived from the City of Moorpark's General Plan Circulation Element. The traffic mix data (i.e., the vehicle makeup of the traffic on the roadways in terms of percentages of cars, medium trucks, and heavy trucks) for the arterials are based upon surveys (conducted by the County of Orange) of roadways in Southern California. The traffic mix information is considered typical for arterials in the Southern California area and is applicable to the City of Moorpark.

4.0 RESULTS

4.1 Measurement Results

The noise measurement program was conducted over a period of three days. The survey was taken on March 15th, March 29th, and on April 4th, 1994, at 27 locations throughout the City. The results of the ambient short-term noise measurements at each site are shown in Table 1. The results of the long term measurements are shown in Table 2; this table also shows the date and time of the measurements. The quantities measured were the Equivalent Noise Level (Leq), the maximum noise level (Lmax) and the Percent Noise Levels (L%).

The first part of the report is a general introduction to the project. It describes the purpose of the study, the scope of the work, and the organization of the report. The second part of the report is a detailed description of the methodology used in the study. This includes a discussion of the data sources, the data collection methods, and the data analysis techniques. The third part of the report is a presentation of the results of the study. This includes a discussion of the findings, a comparison of the results with previous research, and a discussion of the implications of the findings. The fourth part of the report is a conclusion and a list of references.

1.1 Introduction

The purpose of this study is to investigate the effects of the proposed changes on the system. The study is organized as follows: Chapter 2 describes the system and the proposed changes. Chapter 3 describes the methodology used in the study. Chapter 4 presents the results of the study. Chapter 5 discusses the implications of the findings. Chapter 6 is a conclusion and a list of references.

1.2 Objectives

1.3 Scope

The study is limited to the effects of the proposed changes on the system. It does not include a detailed analysis of the system itself. The study is limited to the effects of the proposed changes on the system. It does not include a detailed analysis of the system itself. The study is limited to the effects of the proposed changes on the system. It does not include a detailed analysis of the system itself.

RESOLUTION NO. PC-97-_____

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF MOORPARK, CALIFORNIA RECOMMENDING TO THE CITY COUNCIL THE ADOPTION OF THE UPDATE TO THE NOISE ELEMENT OF THE CITY OF MOORPARK GENERAL PLAN

WHEREAS, at a duly notice public hearing on January 12, 1998, regarding consideration of said update to the Noise Element of the City of Moorpark General Plan; and,

WHEREAS, at its' meeting of January 12, 1998, the Planning Commission opened the public hearing, took testimony from all those wishing to testify, and closed the pubic hearing; and,

WHEREAS, the Planning Commission, after review and consideration of the information contained in the staff report dated January 12, 1998, made a recommendation to the City Council; and,

NOW, THEREFORE, THE PLANNING COMMISSION OF THE CITY OF MOORPARK, CALIFORNIA, DOES RESOLVE AS FOLLOWS:

SECTION 1. That the Planning Commission determined that the update to the Noise Element of the City of Moorpark General Plan will not have the potential for causing a significant effect on the environment, and an Exemption from the provisions of CEQA (California Environmental Quality Act) may be issued, pursuant to Section 15061 of the California Environmental Quality Act.

SECTION 2. That the Planning Commision recommends to the City Council approval of the update to the Noise Element of the Moorpark General Plan (Attached as Exhibit A), with the following findings:

- a. The update sets goals and establishes policies and objectives that will decrease levels of noise sources on new development.
- b. The update identifies the existing impacts of noise on the City of Moorpark.
- c. The update identifies future impact of noise on the City of Moorpark.

The action of the foregoing direction was approved by the following roll call vote:

Ayes:
Noes:
Absent:

PASSED APPROVED AND ADOPTED ON _____, DAY OF _____ 1998.

Ernesto Acosta, Chair

ATTEST:

Celia LaFleur, Secretary
to the Planning Commission

RESOLUTION NO. PC-97-_____

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF MOORPARK, CALIFORNIA RECOMMENDING TO THE CITY COUNCIL THE ADOPTION OF AN ORDINANCE AMENDING THE CITY OF MOORPARK MUNICIPAL CODE BY ADDING CHAPTER 17.53 REFERRING TO NOISE

WHEREAS, at a duly notice public hearing on January 12, 1998, regarding consideration of said amendment of the city of Moorpark Municipal Code by adding Section 17.53 a Noise Ordinance; and

WHEREAS, at its' meeting of January 12, 1998, the Planning Commission opened the public hearing, took testimony from all those wishing to testify, and closed the pubic hearing; and,

WHEREAS, the Planning Commission, after review and consideration of the information contained in the staff report dated January 12, 1998 and made a recommendation to the City Council; and,

NOW, THEREFORE, THE PLANNING COMMISSION OF THE CITY OF MOORPARK, CALIFORNIA, DOES RESOLVE AS FOLLOWS:

SECTION 1. That the Planning Commission determined that the City of Moorpark Municipal Code will not have the potential for causing a significant effect on the environment, and an Exemption from the provisions of CEQA (California Environmental Quality Act) has been determined may be issued, pursuant to Section 15061 of the California Environmental Quality Act Guidelines.

SECTION 2. That the Planning Commission recommends to the City Council approval of the amendment to the City of Moorpark Municipal Code by adding Section 17.53. (Attached as Exhibit A), with the following findings:

- a. The Amendment to the Municipal Code would potentially decrease the level of noise sources on new development.
- b. The Amendment to the Municipal Code would allow for the enforcement of the of Community Noise Equivalency Level (CNEL) by identifying parameters for noise levels in all zoning districts in the community.

- c. The Amendment to the Municipal Code and establishing acceptable decibel levels of noise on interior and exterior noise sources.

The action of the foregoing direction was approved by the following roll call vote:

Ayes:
Noes:
Absent:

PASSED APPROVED AND ADOPTED ON _____, DAY OF _____ 1998.

Ernesto Acosta, Chair

ATTEST:

Celia LaFleur, Secretary
to the Planning Commission

increased traffic - more noise both existing & projected
different circulation system
updated policies to be more consistent w/ balance
of Grand Plan elements.

* noise impacts related to new development

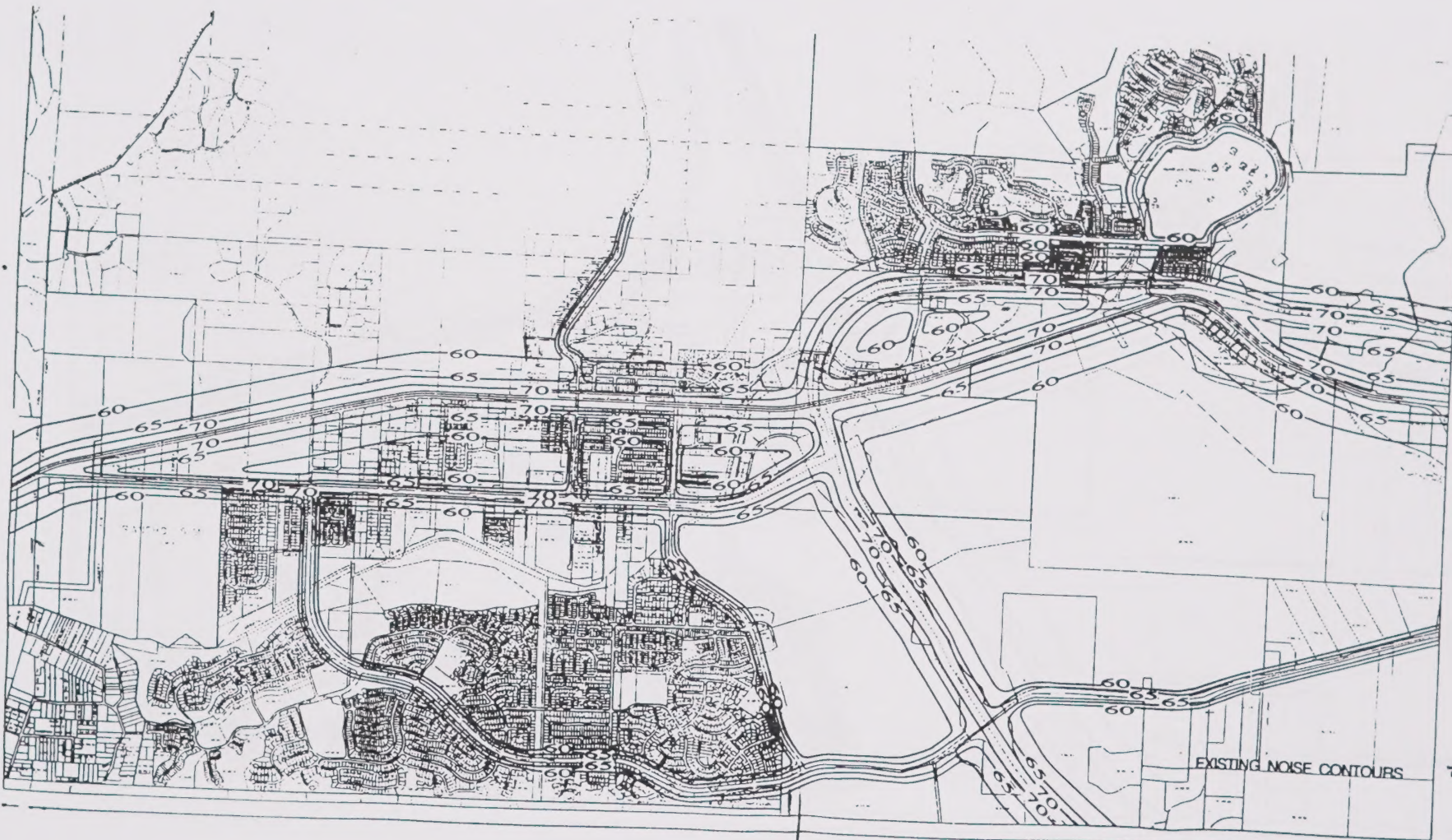
M O O R P A R K
C I T Y O F

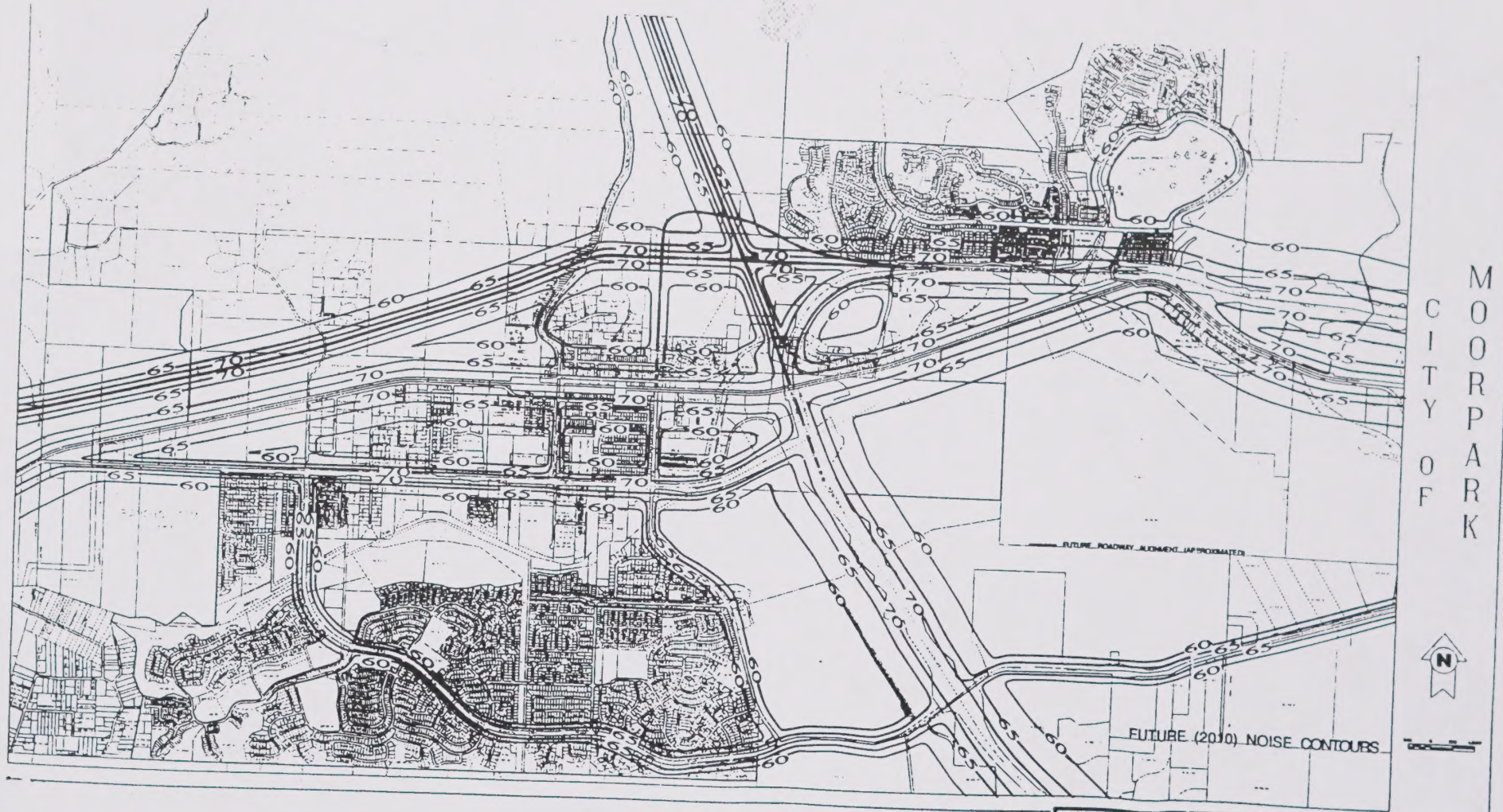


EXISTING NOISE CONTOURS

MESTRE GREVE ASSOCIATES

Exhibit 10
Existing Traffic Noise Contours





MESTRE GREVE ASSOCIATES

Exhibit 11
Futurè Traffic Noise Contours

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